

532622010300

SEQUENCE LISTING

<110> Chardonnens, Agnes
Puzio, Piotr

<120> Nucleic Acid Sequences Encoding Proteins Associated with Abiotic
Stress Response

<130> 532622010300

<140> Not yet assigned

<141> 2005-02-07

<160> 55

<170> PatentIn version 3.1

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Asn Glu Ile Phe Val Ala Ser Lys Thr Tyr Cys Pro Tyr Cys His Ala
20 25 30

gcc cta aac acg ctt ttt gaa aag tta aag gtt ccc agg tcc aaa gtt 144
Ala Leu Asn Thr Leu Phe Glu Lys Leu Lys Val Pro Arg Ser Lys Val
35 40 45

ctg gtt ttg caa ttg aat gac atg aag gaa ggc gca gac att cag gct 192
Leu Val Leu Gln Leu Asn Asp Met Lys Glu Gly Ala Asp Ile Gln Ala
50 55 60

gcg tta tat gag att aat ggc caa aga acc gtg cca aac atc tat att 240
Ala Leu Tyr Glu Ile Asn Gly Gln Arg Thr Val Pro Asn Ile Tyr Ile
65 70 75 80

aat ggt aaa cat att gga ggc aac gac gac ttg cag gaa ttg agg gag 288
Asn Gly Lys His Ile Gly Gly Asn Asp Asp Leu Gln Glu Leu Arg Glu
85 90 95

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Ala Leu Asn Thr Leu Phe Glu Lys Leu Lys Val Pro Arg Ser Lys Val
35 40 45

Leu Val Leu Gln Leu Asn Asp Met Lys Glu Gly Ala Asp Ile Gln Ala
50 55 60

Ala Leu Tyr Glu Ile Asn Gly Gln Arg Thr Val Pro Asn Ile Tyr Ile
65 70 75 80

Asn Gly Lys His Ile Gly Gly Asn Asp Asp Leu Gln Glu Leu Arg Glu
85 90 95

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atc acg ttg ttt gcc aca aga att att gct aaa aga ttt tta tct act	96
Ile Thr Leu Phe Ala Thr Arg Ile Ile Ala Lys Arg Phe Leu Ser Thr	
20 25 30	
cca aaa atg gta tcc cag gaa aca gtt gct cac gta aag gat ctg att	144
Pro Lys Met Val Ser Gln Glu Thr Val Ala His Val Lys Asp Leu Ile	
35 40 45	
ggc caa aag gaa gtg ttt gtt gca gca aag aca tac tgc cct tac tgt	192
Gly Gln Lys Glu Val Phe Val Ala Ala Lys Thr Tyr Cys Pro Tyr Cys	
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aaa gct act ttg tct acc ctc ttc caa gaa ttg aac gtt ccc aaa tcc	240
Lys Ala Thr Leu Ser Thr Leu Phe Gln Glu Leu Asn Val Pro Lys Ser	
65 70 75 80	
aag gcc ctt gtg ttg gaa tta gat gaa atg agc aat ggc tca gag att	288
Lys Ala Leu Val Leu Glu Leu Asp Glu Met Ser Asn Gly Ser Glu Ile	
85 90 95	
caa gac gct tta gaa gaa atc tcg ggc caa aaa act gta cct aac gta	336

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 Gln Asp Ala Leu Glu Glu Ile Ser Gly Gln Lys Thr Val Pro Asn Val
 100 105 110
 tac atc aat ggc aag cac att ggt ggt aac agc gat ttg gaa act ttg 384
 Tyr Ile Asn Gly Lys His Ile Gly Gly Asn Ser Asp Leu Glu Thr Leu
 115 120 125
 aag aaa aat ggc aag tta gct gaa ata ttg aag ccg gta ttt caa tag 432
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Pro Lys Met Val Ser Gln Glu Thr Val Ala His Val Lys Asp Leu Ile
 35 40 45

Gly Gln Lys Glu Val Phe Val Ala Ala Lys Thr Tyr Cys Pro Tyr Cys
 50 55 60

Lys Ala Thr Leu Ser Thr Leu Phe Gln Glu Leu Asn Val Pro Lys Ser
 65 70 75 80

Lys Ala Leu Val Leu Glu Leu Asp Glu Met Ser Asn Gly Ser Glu Ile
 85 90 95

Gln Asp Ala Leu Glu Glu Ile Ser Gly Gln Lys Thr Val Pro Asn Val
 100 105 110

Tyr Ile Asn Gly Lys His Ile Gly Gly Asn Ser Asp Leu Glu Thr Leu
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tac	tgt	tat	aaa	cgc	cac	caa	gca	aga	tat	tac	aca	gca	gca	aaa	ctt		96
Tyr	Cys	Tyr	Lys	Arg	His	Gln	Ala	Arg	Tyr	Tyr	Thr	Ala	Ala	Lys	Leu		
			20					25					30				
ttt	cag	gaa	atg	cct	gtt	att	gaa	att	aac	gat	caa	gag	caa	ttt	act		144
Phe	Gln	Glu	Met	Pro	Val	Ile	Glu	Ile	Asn	Asp	Gln	Glu	Gln	Phe	Thr		
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tac	cta	act	acc	act	gcg	gcc	ggc	gac	aag	tta	atc	gtg	ctt	tat	ttc		192
Tyr	Leu	Thr	Thr	Thr	Ala	Ala	Gly	Asp	Lys	Leu	Ile	Val	Leu	Tyr	Phe		
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His	Thr	Ser	Trp	Ala	Glu	Pro	Cys	Lys	Ala	Leu	Lys	Gln	Val	Phe	Glu		
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gcc	att	agt	aat	gag	cct	tcc	aat	tcc	aac	gtc	tct	ttc	tta	tcc	att		288
Ala	Ile	Ser	Asn	Glu	Pro	Ser	Asn	Ser	Asn	Val	Ser	Phe	Leu	Ser	Ile		
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gat	gcg	gac	gaa	aac	tcg	gaa	att	tca	gaa	ctt	ttt	gaa	atc	tca	gct		336
Asp	Ala	Asp	Glu	Asn	Ser	Glu	Ile	Ser	Glu	Leu	Phe	Glu	Ile	Ser	Ala		
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Val	Pro	Tyr	Phe	Ile	Ile	Ile	His	Lys	Gly	Thr	Ile	Leu	Lys	Glu	Leu		
		115					120					125					
tcc	ggc	gcg	gat	cca	aag	gag	tat	gtg	tct	tta	tta	gaa	gac	tgc	aag		432
Ser	Gly	Ala	Asp	Pro	Lys	Glu	Tyr	Val	Ser	Leu	Leu	Glu	Asp	Cys	Lys		
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145					150					155					160		
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Asn	Val	Asn	Glu	Gly	Ser	His	Asn	Asp	Glu	Asp	Asp	Asp	Asp	Glu	Glu		
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gag	gaa	gaa	gaa	act	gag	gag	caa	ata	aac	gct	aga	ttg	act	aaa	ttg		576
Glu	Glu	Glu	Glu	Thr	Glu	Glu	Gln	Ile	Asn	Ala	Arg	Leu	Thr	Lys	Leu		
				180				185					190				
gtc	aat	gcc	gcg	ccg	gta	atg	tta	ttt	atg	aag	ggg	agc	ccc	tct	gaa		624
Val	Asn	Ala	Ala	Pro	Val	Met	Leu	Phe	Met	Lys	Gly	Ser	Pro	Ser	Glu		
		195					200					205					
cct	aaa	tgc	ggg	ttt	tcg	aga	caa	ctt	gtg	ggg	atc	ttg	aga	gaa	cat		672
Pro	Lys	Cys	Gly	Phe	Ser	Arg	Gln	Leu	Val	Gly	Ile	Leu	Arg	Glu	His		
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caa	gta	aga	ttt	ggc	ttc	ttt	gat	ata	tta	aga	gac	gaa	tct	gtt	aga		720
Gln	Val	Arg	Phe	Gly	Phe	Phe	Asp	Ile	Leu	Arg	Asp	Glu	Ser	Val	Arg		
225					230					235					240		
caa	aac	ttg	aaa	aag	ttt	tct	gaa	tgg	cca	act	ttc	cct	caa	ctt	tat		768
Gln	Asn	Leu	Lys	Lys	Phe	Ser	Glu	Trp	Pro	Thr	Phe	Pro	Gln	Leu	Tyr		

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245

250

255

ata aat ggg gag ttt caa ggc ggt tta gac att atc aag gaa tcc ttg 816
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gag gaa gac cct gat ttt ttg cag cat gct ctc caa tct taa 858
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 275 280 285

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Phe Gln Glu Met Pro Val Ile Glu Ile Asn Asp Gln Glu Gln Phe Thr
 35 40 45

Tyr Leu Thr Thr Thr Ala Ala Gly Asp Lys Leu Ile Val Leu Tyr Phe
 50 55 60

His Thr Ser Trp Ala Glu Pro Cys Lys Ala Leu Lys Gln Val Phe Glu
 65 70 75 80

Ala Ile Ser Asn Glu Pro Ser Asn Ser Asn Val Ser Phe Leu Ser Ile
 85 90 95

Asp Ala Asp Glu Asn Ser Glu Ile Ser Glu Leu Phe Glu Ile Ser Ala
 100 105 110

Val Pro Tyr Phe Ile Ile Ile His Lys Gly Thr Ile Leu Lys Glu Leu
 115 120 125

Ser Gly Ala Asp Pro Lys Glu Tyr Val Ser Leu Leu Glu Asp Cys Lys
 130 135 140

Asn Ser Val Asn Ser Gly Ser Ser Gln Thr His Thr Met Glu Asn Ala
 145 150 155 160

Asn Val Asn Glu Gly Ser His Asn Asp Glu Asp Asp Asp Asp Glu Glu
 165 170 175

Glu Glu Glu Glu Thr Glu Glu Gln Ile Asn Ala Arg Leu Thr Lys Leu
 180 185 190

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Val Asn Ala Ala Pro Val Met Leu Phe Met Lys Gly Ser Pro Ser Glu
195 200 205

Pro Lys Cys Gly Phe Ser Arg Gln Leu Val Gly Ile Leu Arg Glu His
210 215 220

Gln Val Arg Phe Gly Phe Phe Asp Ile Leu Arg Asp Glu Ser Val Arg
225 230 235 240

Gln Asn Leu Lys Lys Phe Ser Glu Trp Pro Thr Phe Pro Gln Leu Tyr
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Glu Glu Asp Pro Asp Phe Leu Gln His Ala Leu Gln Ser
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act aca aac gct gct aat aaa ctc att gtc tta tat ttt aaa gct caa	96
Thr Thr Asn Ala Ala Asn Lys Leu Ile Val Leu Tyr Phe Lys Ala Gln	
20 25 30	
tgg gct gat cct tgc aaa act atg agc cag gtg cta gaa gct gtt agt	144
Trp Ala Asp Pro Cys Lys Thr Met Ser Gln Val Leu Glu Ala Val Ser	
35 40 45	
gaa aaa gtt agg caa gag gat gtc cgg ttt tta tca ata gat gca gac	192
Glu Lys Val Arg Gln Glu Asp Val Arg Phe Leu Ser Ile Asp Ala Asp	
50 55 60	
gaa cat cca gaa ata tca gac ctt ttt gag att gca gcc gta cca tac	240
Glu His Pro Glu Ile Ser Asp Leu Phe Glu Ile Ala Ala Val Pro Tyr	
65 70 75 80	
ttc gtc ttc att caa aat ggt act att gta aaa gaa ata tca gcc gca	288
Phe Val Phe Ile Gln Asn Gly Thr Ile Val Lys Glu Ile Ser Ala Ala	
85 90 95	
gat cct aag gag ttt gtg aaa agc tta gaa att ctt tcg aat gct tct	336
Asp Pro Lys Glu Phe Val Lys Ser Leu Glu Ile Leu Ser Asn Ala Ser	
100 105 110	

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ttc atg aaa gga agc cca tca gaa cct aaa tgc gga ttt tct aga cag Phe Met Lys Gly Ser Pro Ser Glu Pro Lys Cys Gly Phe Ser Arg Gln 165 170 175	528
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Trp Ala Asp Pro Cys Lys Thr Met Ser Gln Val Leu Glu Ala Val Ser 35 40 45
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1				5					10							15			
cgg gct aag act ctt ctt cgt tac caa aat cgg atg tat ttg agc aca																			96
Arg Ala Lys Thr Leu Leu Arg Tyr Gln Asn Arg Met Tyr Leu Ser Thr																			
			20					25						30					

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gag Glu	ata Ile	aga Arg	aaa Lys	gct Ala	att Ile	gaa Glu	gat Asp	gcc Ala	atc Ile	gaa Glu	tcg Ser	gct Ala	cca Pro	gtg Val	gtt Val	144
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ctt Leu	ttc Phe	atg Met	aaa Lys	ggt Gly	act Thr	cct Pro	gaa Glu	ttt Phe	ccc Pro	aag Lys	tgt Cys	gga Gly	ttt Phe	tca Ser	aga Arg	192
		50				55					60					
gca Ala	acc Thr	att Ile	gga Gly	tta Leu	tta Leu	gga Gly	aat Asn	caa Gln	ggc Gly	gtt Val	gac Asp	ccg Pro	gcc Ala	aaa Lys	ttt Phe	240
		65			70					75					80	
gcg Ala	gct Ala	tat Tyr	aat Asn	gtt Val	tta Leu	gaa Glu	gac Asp	cca Pro	gag Glu	cta Leu	cgt Arg	gaa Glu	ggg Gly	atc Ile	aaa Lys	288
				85					90					95		
gag Glu	ttt Phe	tca Ser	gaa Glu	tgg Trp	cca Pro	act Thr	att Ile	cca Pro	cag Gln	tta Leu	tat Tyr	gta Val	aac Asn	aaa Lys	gaa Glu	336
			100					105					110			
ttc Phe	att Ile	ggg Gly	gga Gly	tgt Cys	gat Asp	gtt Val	att Ile	aca Thr	agt Ser	atg Met	gca Ala	cgc Arg	tct Ser	ggg Gly	gaa Glu	384
		115					120					125				
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Glu	Ile	Arg 35	Lys	Ala	Ile	Glu	Asp 40	Ala	Ile	Glu	Ser	Ala 45	Pro	Val	Val	
Leu	Phe	Met	Lys	Gly	Thr	Pro	Glu 55	Phe	Pro	Lys	Cys 60	Gly	Phe	Ser	Arg	
Ala	Thr	Ile	Gly	Leu	Leu	Gly	Asn 70	Gln	Gly	Val 75	Asp	Pro	Ala	Lys	Phe 80	
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Glu Phe Ser Glu Trp Pro Thr Ile Pro Gln Leu Tyr Val Asn Lys Glu
 100 105 110

Phe Ile Gly Gly Cys Asp Val Ile Thr Ser Met Ala Arg Ser Gly Glu
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Glu Glu Thr Lys Asp Arg
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tct ggc gac aag tta gtc gtt gtt gac ttt ttt gcc aca tgg tgt ggg 96
 Ser Gly Asp Lys Leu Val Val Val Asp Phe Phe Ala Thr Trp Cys Gly
 20 25 30

cca tgt aaa atg att gca cca atg att gaa aag ttt gca gaa caa tat 144
 Pro Cys Lys Met Ile Ala Pro Met Ile Glu Lys Phe Ala Glu Gln Tyr
 35 40 45

tct gac gct gct ttt tac aag ttg gat gtt gat gaa gtc tca gat gtt 192
 Ser Asp Ala Ala Phe Tyr Lys Leu Asp Val Asp Glu Val Ser Asp Val
 50 55 60

gct caa aaa gct gaa gtt tct tcc atg cct acc cta atc ttc tac aag 240
 Ala Gln Lys Ala Glu Val Ser Ser Met Pro Thr Leu Ile Phe Tyr Lys
 65 70 75 80

ggc ggt aag gag gtt acc aga gtc gtc ggt gcc aac cca gct gct atc 288
 Gly Gly Lys Glu Val Thr Arg Val Val Gly Ala Asn Pro Ala Ala Ile
 85 90 95

aag caa gct att gct tcc aac gta tagttgccgg tatattaacg ctacgtaaag 342
 Lys Gln Ala Ile Ala Ser Asn Val
 100

tacatcatgt ttaccagttt aaataaaca ttttaaaaag aaactctatt acatctatct 402

atcattatatt tcttcattgt ctattgtata tttcatcatc ggtgtaacca agaatgtata 462

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 35 40 45

Ser Asp Ala Ala Phe Tyr Lys Leu Asp Val Asp Glu Val Ser Asp Val
 50 55 60

Ala Gln Lys Ala Glu Val Ser Ser Met Pro Thr Leu Ile Phe Tyr Lys
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Lys Gln Ala Ile Ala Ser Asn Val
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 Gln Asp Lys Leu Val Val Val Asp Phe Tyr Ala Thr Trp Cys Gly Pro
 20 25 30

tgt aaa atg att gct cca atg att gaa aaa ttc tct gaa caa tac cca 144
 Cys Lys Met Ile Ala Pro Met Ile Glu Lys Phe Ser Glu Gln Tyr Pro
 35 40 45

caa gct gat ttc tat aaa ttg gat gtc gat gaa ttg ggt gat gtt gca 192
 Gln Ala Asp Phe Tyr Lys Leu Asp Val Asp Glu Leu Gly Asp Val Ala
 50 55 60

caa aag aat gaa gtt tcc gct atg cca act ttg ctt cta ttc aag aac 240
 Gln Lys Asn Glu Val Ser Ala Met Pro Thr Leu Leu Phe Lys Asn
 65 70 75 80

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Gly Lys Glu Val Ala Lys Val Val Gly Ala Asn Pro Ala Ala Ile Lys
85 90 95

caa gcc att gct gct aat gct taaa 313
Gln Ala Ile Ala Ala Asn Ala
100

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<213> Saccharomyces cerevisiae
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20 25 30

Cys Lys Met Ile Ala Pro Met Ile Glu Lys Phe Ser Glu Gln Tyr Pro
35 40 45

Gln Ala Asp Phe Tyr Lys Leu Asp Val Asp Glu Leu Gly Asp Val Ala
50 55 60

Gln Lys Asn Glu Val Ser Ala Met Pro Thr Leu Leu Leu Phe Lys Asn
65 70 75 80

Gly Lys Glu Val Ala Lys Val Val Gly Ala Asn Pro Ala Ala Ile Lys
85 90 95

Gln Ala Ile Ala Ala Asn Ala
100

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aagag atg ggt tct atg ttc agt gga aat cga ttg aac aag gaa gag atg 170
Met Gly Ser Met Phe Ser Gly Asn Arg Leu Asn Lys Glu Glu Met
1 5 10 15

gag gtt gtc gtg aac aag gcc aaa gag atc gtc tcc gct cac ccg gtc 218

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Val Val Phe Ser Lys Thr Tyr Cys Gly Tyr Cys Gln Arg Val Lys Gln
35 40 45
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Leu Leu Thr Gln Leu Gly Ala Thr Phe Lys Val Leu Glu Leu Asp Glu
50 55 60
atg agt gat gga ggt gag atc caa tca gct tta tct gag tgg act gga 362
Met Ser Asp Gly Gly Glu Ile Gln Ser Ala Leu Ser Glu Trp Thr Gly
65 70 75
cag agc act gtt cct aat gtt ttc atc aaa ggc aaa cat atc ggt gga 410
Gln Ser Thr Val Pro Asn Val Phe Ile Lys Gly Lys His Ile Gly Gly
80 85 90 95
tgc gat aga gtg atg gag agt aac aag caa ggc aag ctt gtg cct cta 458
Cys Asp Arg Val Met Glu Ser Asn Lys Gln Gly Lys Leu Val Pro Leu
100 105 110
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Leu Thr Glu Ala Gly Ala Ile Ser Asn
115 120
gaaaactctg aaactataaaa cagtggaaat gaagaagaat gttatatgtt acatactgtc 565
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35 40 45
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50 55 60
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65 70 75 80
Ser Thr Val Pro Asn Val Phe Ile Lys Gly Lys His Ile Gly Gly Cys
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Arg Val Glu Val Thr Ala Val His Ile Leu Leu Ile Leu Ala Val Val
10 15 20 25
ccc agc gat ctg tca atc tct gca gga gct gag aaa tcg gtg gct gca 148
Pro Ser Asp Leu Ser Ile Ser Ala Gly Ala Glu Lys Ser Val Ala Ala
30 35 40
ttt gtg cag aac gcc ata ttg tcc aac aag att gtc atc ttc tcc aag 196
Phe Val Gln Asn Ala Ile Leu Ser Asn Lys Ile Val Ile Phe Ser Lys
45 50 55
tcc tac tgc ccg tat tgc ttg cgc tcg aaa cgc att ttc aga gaa ctt 244
Ser Tyr Cys Pro Tyr Cys Leu Arg Ser Lys Arg Ile Phe Arg Glu Leu
60 65 70
aag gaa cag cct ttt gtc gtg gag ctt gat ctc aga gag gac gga gat 292
Lys Glu Gln Pro Phe Val Val Glu Leu Asp Leu Arg Glu Asp Gly Asp
75 80 85
aaa ata cag tac gag ctt ctg gaa ttt gtt ggt cgc cgt acc gtc ccc 340
Lys Ile Gln Tyr Glu Leu Leu Glu Phe Val Gly Arg Arg Thr Val Pro
90 95 100
caa gtt ttt gtt aac ggc aag cat att ggt ggc tct gat gat ctt gca 388
Gln Val Phe Val Asn Gly Lys His Ile Gly Gly Ser Asp Asp Leu Ala
110 115 120
gat tct gtg gag aat ggt cag ttg caa aag ctt ctt gct gct agt 433
Asp Ser Val Glu Asn Gly Gln Leu Gln Lys Leu Leu Ala Ala Ser
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Arg Ser Lys Arg Ile Phe Arg Glu Leu Lys Glu Gln Pro Phe Val Val
65 70 75 80

Glu Leu Asp Leu Arg Glu Asp Gly Asp Lys Ile Gln Tyr Glu Leu Leu
85 90 95

Glu Phe Val Gly Arg Arg Thr Val Pro Gln Val Phe Val Asn Gly Lys
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Leu Ala Ser Ser Pro Arg Asp Ser Phe Pro Ser Ile Ser Ser Ser Thr 15 20 25

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Ser Tyr Ser Val Ser Leu Ile Ser Phe Gly Phe Arg Asn Ser Val Gly 30 35 40

tct cct ctc aag aaa tgt tct cta aag cag acg tgt tct gtt cga gcc 195
Ser Pro Leu Lys Lys Cys Ser Leu Lys Gln Thr Cys Ser Val Arg Ala 45 50 55

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Thr Val Ala Asp Asn Thr Val Val Val Tyr Ser Lys Thr Trp Cys Pro	
75 80 85 90	
tac tgt tct gaa gtg aag aca ttg ttc aag aga ctt ggt gtt cag cca	339
Tyr Cys Ser Glu Val Lys Thr Leu Phe Lys Arg Leu Gly Val Gln Pro	
95 100 105	
ctg gtg gtt gag ttg gat gaa ctt ggt cca caa ggg aca caa cta cag	387
Leu Val Val Glu Leu Asp Glu Leu Gly Pro Gln Gly Thr Gln Leu Gln	
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Lys Val Leu Glu Thr Leu Thr Gly Gln Arg Thr Val Pro Asn Val Phe	
125 130 135	
gtc gga ggc aag cac att ggt ggc tgc aca gat aca gta aac ctg aac	483
Val Gly Gly Lys His Ile Gly Gly Cys Thr Asp Thr Val Asn Leu Asn	
140 145 150	
agg aaa gga gaa ctg gaa ttg atg tta gct gaa gcc aac gct aaa acc	531
Arg Lys Gly Glu Leu Glu Leu Met Leu Ala Glu Ala Asn Ala Lys Thr	
155 160 165 170	
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Asp Gln Thr	
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35 40 45

Ser Leu Lys Gln Thr Cys Ser Val Arg Ala Met Ser Ser Ser Ser Phe
50 55 60

Glu Ser Gly Met Glu Glu Ser Val Lys Lys Thr Val Ala Asp Asn Thr
65 70 75 80

532622010300
Val Val Val Tyr Ser Lys Thr Trp Cys Pro Tyr Cys Ser Glu Val Lys
85 90 95

Thr Leu Phe Lys Arg Leu Gly Val Gln Pro Leu Val Val Glu Leu Asp
100 105 110

Glu Leu Gly Pro Gln Gly Thr Gln Leu Gln Lys Val Leu Glu Thr Leu
115 120 125

Thr Gly Gln Arg Thr Val Pro Asn Val Phe Val Gly Gly Lys His Ile
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Ala Leu Val Ser Ser Ile Ser Ile Val Ser Ser Ala Ser Ser Ser Pro
15 20 25 30

gaa gcc gag ttt gtt aag aag acc atc tct tcc cac aag atc gtt atc 147
Glu Ala Glu Phe Val Lys Lys Thr Ile Ser Ser His Lys Ile Val Ile
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ttc tcc aaa tcc tac tgc ccg tat tgc agg aga gcc aaa tct gtg ttc 195
Phe Ser Lys Ser Tyr Cys Pro Tyr Cys Arg Arg Ala Lys Ser Val Phe
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Ser Glu Leu Asp Gln Val Pro His Val Val Glu Leu Asp Glu Arg Glu
65 70 75

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Asp Gly Trp Asn Val Gln Ser Ala Leu Gly Glu Ile Val Gly Arg Arg
80 85 90

aca gta cca cag gtt ttc att aac gga aag cac att gga gga tca gac 339
Thr Val Pro Gln Val Phe Ile Asn Gly Lys His Ile Gly Gly Ser Asp
95 100 105 110

gat act gta gaa gcg cat gaa agc ggt gaa ctg gcc aag ctt ctc ggt 387

532622010300
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 Leu Ser Thr Lys Ala Glu Leu
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 caggtgtaag cacttccatt ttccagtttt atgataactt gtaatgtggt ctgaagggtta 501
 taaacgtctt gtcatagctt tgtgaaacga tattaaaggc tacgagttgg attgagattc 561
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 35 40 45

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 50 55 60

Leu Asp Gln Val Pro His Val Val Glu Leu Asp Glu Arg Glu Asp Gly
 65 70 75 80

Trp Asn Val Gln Ser Ala Leu Gly Glu Ile Val Gly Arg Arg Thr Val
 85 90 95

Pro Gln Val Phe Ile Asn Gly Lys His Ile Gly Gly Ser Asp Asp Thr
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Lys Asp Ile Ala Ser Lys Ser Glu Leu Asp Asn Ile Arg Gln Ser Gly
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gca ccg gtg gtg ctt cac ttc tgg gct tcg tgg tgt gat gct tcg aag 152
Ala Pro Val Val Leu His Phe Trp Ala Ser Trp Cys Asp Ala Ser Lys
25 30 35

cag atg gat caa gtc ttc tct cac ctc gct acc gac ttc cct cgc gcc 200
Gln Met Asp Gln Val Phe Ser His Leu Ala Thr Asp Phe Pro Arg Ala
40 45 50

cac ttc ttt agg gta gaa gct gag gaa cat cct gag ata tct gaa gct 248
His Phe Phe Arg Val Glu Ala Glu Glu His Pro Glu Ile Ser Glu Ala
55 60 65

tac tct gtt tct gct gtt ccc tat ttc gtc ttc ttc aag gat ggc aaa 296
Tyr Ser Val Ser Ala Val Pro Tyr Phe Val Phe Phe Lys Asp Gly Lys
70 75 80 85

gct gtg gat aca ctt gag gga gca gat cca tca agt tta gcc aat aaa 344
Ala Val Asp Thr Leu Glu Gly Ala Asp Pro Ser Ser Leu Ala Asn Lys
90 95 100

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Val Gly Lys Val Ala Gly Ser Ser Thr Ser Ala Glu Pro Ala Ala Pro
105 110 115

gca agc cta ggg ctg gct gca ggg cca acg att ctc gaa acc gtc aag 440
Ala Ser Leu Gly Leu Ala Ala Gly Pro Thr Ile Leu Glu Thr Val Lys
120 125 130

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Glu Asn Ala Lys Ala Thr Ser Lys Asp Arg Ala Gln Pro Leu Ser Ser
135 140 145

acc acc aag gaa gct ctc aat acc cgt ttg gag aaa ctc acc aac tct 536
Thr Thr Lys Glu Ala Leu Asn Thr Arg Leu Glu Lys Leu Thr Asn Ser
150 155 160 165

cac cct gtt atg ttg ttc atg aaa ggt acc cct gag gag cct atg tgc 584
His Pro Val Met Leu Phe Met Lys Gly Thr Pro Glu Glu Pro Met Cys
170 175 180

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Gly Phe Ser Lys Asn Val Val Asn Ile Leu Lys Glu Glu Glu Val Glu
185 190 195

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 20 25 30

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 35 40 45

Asp Phe Pro Arg Ala His Phe Phe Arg Val Glu Ala Glu Glu His Pro
 50 55 60

Glu Ile Ser Glu Ala Tyr Ser Val Ser Ala Val Pro Tyr Phe Val Phe
 65 70 75 80

Phe Lys Asp Gly Lys Ala Val Asp Thr Leu Glu Gly Ala Asp Pro Ser
 85 90 95

Ser Leu Ala Asn Lys Val Gly Lys Val Ala Gly Ser Ser Thr Ser Ala
 100 105 110

Glu Pro Ala Ala Pro Ala Ser Leu Gly Leu Ala Ala Gly Pro Thr Ile
 115 120 125

Leu Glu Thr Val Lys Glu Asn Ala Lys Ala Thr Ser Lys Asp Arg Ala
 130 135 140

Gln Pro Leu Ser Ser Thr Thr Lys Glu Ala Leu Asn Thr Arg Leu Glu
 145 150 155 160

Lys Leu Thr Asn Ser His Pro Val Met Leu Phe Met Lys Gly Thr Pro
 165 170 175

Glu Glu Pro Met Cys Gly Phe Ser Lys Asn Val Val Asn Ile Leu Lys
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 195 200 205

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 cag tta ctg acg cag cta gga gca act ttt aaa gta ctt gag ctc gat 144
 Gln Leu Leu Thr Gln Leu Gly Ala Thr Phe Lys Val Leu Glu Leu Asp
 35 40 45
 gaa atg agt gat gga ggt gag atc caa tca gct tta tca gag tgg act 192
 Glu Met Ser Asp Gly Gly Glu Ile Gln Ser Ala Leu Ser Glu Trp Thr
 50 55 60
 gga cag acc aca gtt cca aac gtc ttc atc aaa gga aac cac atc ggt 240
 Gly Gln Thr Thr Val Pro Asn Val Phe Ile Lys Gly Asn His Ile Gly
 65 70 75 80
 gga tgc gat aga gtg atg gag acc aac aag caa ggc aag ctt gtg cct 288
 Gly Cys Asp Arg Val Met Glu Thr Asn Lys Gln Gly Lys Leu Val Pro
 85 90 95
 cta ctt act gaa gct ggg gct att gca gat aac tct tct caa ctt tga 336
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<210> 26
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 35 40 45
 Glu Met Ser Asp Gly Gly Glu Ile Gln Ser Ala Leu Ser Glu Trp Thr
 50 55 60

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Gly Gln Thr Thr Val Pro Asn Val Phe Ile Lys Gly Asn His Ile Gly
65 70 75 80

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Val Phe Ser Lys Thr Tyr Cys Pro Tyr Cys Val Arg Val Lys Glu Leu	
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ttg caa caa ttg gga gct aag ttc aag gcc gtt gag ctc gac acc gaa	144
Leu Gln Gln Leu Gly Ala Lys Phe Lys Ala Val Glu Leu Asp Thr Glu	
35 40 45	
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Ser Asp Gly Ser Gln Ile Gln Ser Gly Leu Ala Glu Trp Thr Gly Gln	
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Arg Thr Val Pro Asn Val Phe Ile Gly Gly Asn His Ile Gly Gly Cys	
65 70 75 80	
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Asp Ala Thr Ser Asn Leu His Lys Asp Gly Lys Leu Val Pro Leu Leu	
85 90 95	
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20 25 30

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35 40 45

Ser Asp Gly Ser Gln Ile Gln Ser Gly Leu Ala Glu Trp Thr Gly Gln
50 55 60

Arg Thr Val Pro Asn Val Phe Ile Gly Gly Asn His Ile Gly Gly Cys
65 70 75 80

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85 90 95

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<223> AtQ9FVX1

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Phe Val Val Leu Cys Asp Leu Ser Asn Ser Ala Gly Ala Asn Ser	
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Val Ser Ala Phe Val Gln Asn Ala Ile Leu Ser Asn Lys Ile Val Ile	
35 40 45	
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Phe Ser Lys Ser Tyr Cys Pro Tyr Cys Leu Arg Ser Lys Arg Ile Phe	
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agc caa ctt aag gaa gag cca ttt gtt gtg gag ctt gat cag aga gag	240
Ser Gln Leu Lys Glu Glu Pro Phe Val Val Glu Leu Asp Gln Arg Glu	
65 70 75 80	
gac gga gat caa atc cag tat gag ctt tta gaa ttc gtt ggt cgt cgt	288
Asp Gly Asp Gln Ile Gln Tyr Glu Leu Leu Glu Phe Val Gly Arg Arg	
85 90 95	
act gtc ccg caa gtt ttt gtt aac ggc aag cat att ggt gga tca gat	336
Thr Val Pro Gln Val Phe Val Asn Gly Lys His Ile Gly Gly Ser Asp	
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gat ctt gga gct gct ttg gag agt ggt cag ttg caa aag ctt ctt gct	384
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393

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<210> 30
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Phe Val Val Leu Cys Asp Leu Ser Asn Ser Ala Gly Ala Ala Asn Ser
20 25 30

Val Ser Ala Phe Val Gln Asn Ala Ile Leu Ser Asn Lys Ile Val Ile
35 40 45

Phe Ser Lys Ser Tyr Cys Pro Tyr Cys Leu Arg Ser Lys Arg Ile Phe
50 55 60

Ser Gln Leu Lys Glu Glu Pro Phe Val Val Glu Leu Asp Gln Arg Glu
65 70 75 80

Asp Gly Asp Gln Ile Gln Tyr Glu Leu Leu Glu Phe Val Gly Arg Arg
85 90 95

Thr Val Pro Gln Val Phe Val Asn Gly Lys His Ile Gly Gly Ser Asp
100 105 110

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115 120 125

Ala Ser
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Ile	Ser	Met	Val	Ser	Ser	Ala	Ala	Ser	Ser	Pro	Glu	Ala	Asp	Phe	Val	
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Lys	Lys	Thr	Ile	Ser	Ser	His	Lys	Ile	Val	Ile	Phe	Ser	Lys	Ser	Tyr	
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Cys	Pro	Tyr	Cys	Lys	Lys	Ala	Lys	Ser	Val	Phe	Arg	Glu	Leu	Asp	Gln	
			55					60					65			
gtt	cct	tat	gtt	gtc	gag	ctt	gat	gaa	aga	gaa	gat	ggg	tgg	agc	atc	296
Val	Pro	Tyr	Val	Val	Glu	Leu	Asp	Glu	Arg	Glu	Asp	Gly	Trp	Ser	Ile	
		70					75					80				
cag	act	gca	ctt	gga	gag	att	gtt	gga	agg	cga	aca	gta	ccg	caa	gtc	344
Gln	Thr	Ala	Leu	Gly	Glu	Ile	Val	Gly	Arg	Arg	Thr	Val	Pro	Gln	Val	
		85				90					95					
ttc	att	aac	gga	aaa	cat	ctc	gga	gga	tca	gat	gat	acc	gta	gat	gcg	392
Phe	Ile	Asn	Gly	Lys	His	Leu	Gly	Gly	Ser	Asp	Asp	Thr	Val	Asp	Ala	
100					105					110					115	
tat	gag	agc	ggg	gaa	ctc	gcc	aag	ctt	ctt	ggg	gtt	tcc	ggg	aac	aaa	440
Tyr	Glu	Ser	Gly	Glu	Leu	Ala	Lys	Leu	Leu	Gly	Val	Ser	Gly	Asn	Lys	
				120				125						130		
gaa	gct	gaa	ctc	taggttatat	atagttggaa	gaattgataa	cactctctgt									492
Glu	Ala	Glu	Leu													
			135													
gatgcttagg	tgtaagcaat	tcaatttcca	tttgtattgt	gttctgcagc	ttgatcatga											552
ccttgtgaca	gcttgatctt	gccttttaaa	cgtatcttat	caaagaccac	attctgagtt											612
aaaaaaaaa	aaaaaaaa															629

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Val	Thr	Phe	Ile	Ser	Met	Val	Ser	Ser	Ala	Ala	Ser	Ser	Pro	Glu	Ala	
			20					25					30			
Asp	Phe	Val	Lys	Lys	Thr	Ile	Ser	Ser	His	Lys	Ile	Val	Ile	Phe	Ser	
		35					40					45				
Lys	Ser	Tyr	Cys	Pro	Tyr	Cys	Lys	Lys	Ala	Lys	Ser	Val	Phe	Arg	Glu	
		50				55					60					

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Leu Asp Gln Val Pro Tyr Val Val Glu Leu Asp Glu Arg Glu Asp Gly
65 70 75 80

Trp Ser Ile Gln Thr Ala Leu Gly Glu Ile Val Gly Arg Arg Thr Val
85 90 95

Pro Gln Val Phe Ile Asn Gly Lys His Leu Gly Gly Ser Asp Asp Thr
100 105 110

Val Asp Ala Tyr Glu Ser Gly Glu Leu Ala Lys Leu Leu Gly Val Ser
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Gly Asn Lys Glu Ala Glu Leu
130 135

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1 5 10 15	
aat tca aat cca gca atc tct ttc tcc atg tta agc gga atc aga aac	96
Asn Ser Asn Pro Ala Ile Ser Phe Ser Met Leu Ser Gly Ile Arg Asn	
20 25 30	
ttg ggc atg tta cct ttc agg aga tgt cta aag ccg aca gtt atc gga	144
Leu Gly Met Leu Pro Phe Arg Arg Cys Leu Lys Pro Thr Val Ile Gly	
35 40 45	
atc gcg tcg tgg cca cca ctc cgt tgt tct tct gtt aag gct atg tct	192
Ile Ala Ser Trp Pro Pro Leu Arg Cys Ser Ser Val Lys Ala Met Ser	
50 55 60	
tca tca tcg tct tcg tct gga tcg aca ttg gag gag act gtt aaa acg	240
Ser Ser Ser Ser Ser Ser Gly Ser Thr Leu Glu Glu Thr Val Lys Thr	
65 70 75 80	
act gtg gca gag aac cct gtc gtt gtt tac tcc aaa acc tgg tgc tca	288
Thr Val Ala Glu Asn Pro Val Val Val Tyr Ser Lys Thr Trp Cys Ser	
85 90 95	
tac tcg tct caa gtg aag tcc ttg ttc aag agt ctt caa gtt gag cca	336
Tyr Ser Ser Gln Val Lys Ser Leu Phe Lys Ser Leu Gln Val Glu Pro	
100 105 110	
ctg gtt gtt gaa ttg gat caa ctt ggt tca gaa ggg tcg cag ctg cag	384
Leu Val Val Glu Leu Asp Gln Leu Gly Ser Glu Gly Ser Gln Leu Gln	
115 120 125	

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aat gtg ttg gag aaa att act gga caa tac act gtt ccc aat gtt ttc	432
Asn Val Leu Glu Lys Ile Thr Gly Gln Tyr Thr Val Pro Asn Val Phe	
130 135 140	
atc gga ggc aag cac att ggt ggc tgc tca gat aca ttg cag ctg cac	480
Ile Gly Gly Lys His Ile Gly Gly Cys Ser Asp Thr Leu Gln Leu His	
145 150 155 160	
aat aaa gga gag ctg gaa gca att tta gct gaa gcc aat gga aaa aac	528
Asn Lys Gly Glu Leu Glu Ala Ile Leu Ala Glu Ala Asn Gly Lys Asn	
165 170 175	
ggt cag acc tag	540
Gly Gln Thr	

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Leu Gly Met Leu Pro Phe Arg Arg Cys Leu Lys Pro Thr Val Ile Gly	
35 40 45	
Ile Ala Ser Trp Pro Pro Leu Arg Cys Ser Ser Val Lys Ala Met Ser	
50 55 60	
Ser Ser Ser Ser Ser Ser Gly Ser Thr Leu Glu Glu Thr Val Lys Thr	
65 70 75 80	
Thr Val Ala Glu Asn Pro Val Val Val Tyr Ser Lys Thr Trp Cys Ser	
85 90 95	
Tyr Ser Ser Gln Val Lys Ser Leu Phe Lys Ser Leu Gln Val Glu Pro	
100 105 110	
Leu Val Val Glu Leu Asp Gln Leu Gly Ser Glu Gly Ser Gln Leu Gln	
115 120 125	
Asn Val Leu Glu Lys Ile Thr Gly Gln Tyr Thr Val Pro Asn Val Phe	
130 135 140	
Ile Gly Gly Lys His Ile Gly Gly Cys Ser Asp Thr Leu Gln Leu His	
145 150 155 160	

Asn Lys Gly Glu Leu Glu Ala Ile Leu Ala Glu Ala Asn Gly Lys Asn
165 170 175

Gly Gln Thr

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20 25 30

Gly Met Met Arg Phe Ser Ser Thr Val Pro Ser Asp Ser Asp Thr His
35 40 45

Asp Asp Phe Lys Pro Thr Gln Lys Val Pro Pro Asp Ser Thr Asp Ser
50 55 60

Leu Lys Asp Ile Val Glu Asn Asp Val Lys Asp Asn Pro Val Met Ile
65 70 75 80

Tyr Met Lys Gly Val Pro Glu Ser Pro Gln Cys Gly Phe Ser Ser Leu
85 90 95

Ala Val Arg Val Leu Gln Gln Tyr Asn Val Pro Ile Ser Ser Arg Asn
100 105 110

Ile Leu Glu Asp Gln Glu Leu Lys Asn Ala Val Lys Ser Phe Ser His
115 120 125

Trp Pro Thr Phe Pro Gln Ile Phe Ile Lys Gly Glu Phe Ile Gly Gly
130 135 140

Ser Asp Ile Ile Leu Asn Met His Lys Glu Gly Glu Leu Glu Gln Lys
145 150 155 160

Leu Lys Asp Val Ser Gly Asn Gln Asp
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Met Ala Leu Arg Ser Val Lys Thr Pro Thr Leu Ile Thr Ser Val Ala
1 5 10 15

48

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gtc gtc tcc tcc tcc gtt acc aac aag cct cac tct atc aga ttc tct Val Val Ser Ser Ser Val Thr Asn Lys 25 Pro His Ser Ile Arg Phe Ser	96
ctt aaa cca acg tcg gca ctc gtc gtc cat aac cat cag cta tcg ttc Leu Lys Pro 35 Thr Ser Ala Leu Val 40 Val His Asn His Gln 45 Leu Ser Phe	144
tac ggt tcg aat ctc aag ctg aaa cca act aaa ttc cga tgc tca gcg Tyr Gly Ser Asn Leu Lys 55 Leu Lys Pro Thr Lys Phe 60 Arg Cys Ser Ala	192
tcg gct ctt acg ccg caa ctt aaa gac acg ctg gag aaa ctg gtg aat Ser Ala Leu Thr Pro 70 Gln Leu Lys Asp Thr 75 Leu Glu Lys Leu Val 80 Asn	240
tcg gag aaa gtg gtt ctg ttt atg aaa gga acg aga gac ttc ccg atg Ser Glu Lys Val 85 Val Leu Phe Met Lys Gly 90 Thr Arg Asp Phe 95 Pro Met	288
tgt gga ttc tcc aac act gtg gtt cag att ttg aag aat ctg aat gtt Cys Gly Phe Ser 100 Asn Thr Val Val 105 Gln Ile Leu Lys Asn Leu 110 Asn Val	336
cct ttc gaa gat gtg aat att ctg gag aat gag atg ttg agg caa gga Pro Phe Glu Asp Val 115 Asn Ile Leu 120 Glu Asn Glu Met Leu Arg Gln Gly	384
ctt aaa gag tat tcg aat tgg ccg acg ttt cct cag ctt tat atc ggc Leu Lys 130 Glu Tyr Ser Asn Trp 135 Pro Thr Phe Pro Gln 140 Leu Tyr Ile Gly	432
ggt gag ttt ttc ggt ggt tgt gat att act ctt gag gcg ttt aag act Gly Glu Phe Phe Gly Gly Cys Asp Ile Thr Leu 155 Glu Ala Phe Lys Thr 160	480
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 <212> PRT
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Val Val Ser Ser Ser Val Thr Asn Lys Pro His Ser Ile Arg Phe Ser 20 25 30
Leu Lys Pro Thr Ser Ala Leu Val Val His Asn His Gln Leu Ser Phe 35 40 45
Tyr Gly Ser Asn Leu Lys Leu Lys Pro Thr Lys Phe Arg Cys Ser Ala 50 55 60

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Ser Ala Leu Thr Pro Gln Leu Lys Asp Thr Leu Glu Lys Leu Val Asn
65 70 75 80

Ser Glu Lys Val Val Leu Phe Met Lys Gly Thr Arg Asp Phe Pro Met
85 90 95

Cys Gly Phe Ser Asn Thr Val Val Gln Ile Leu Lys Asn Leu Asn Val
100 105 110

Pro Phe Glu Asp Val Asn Ile Leu Glu Asn Glu Met Leu Arg Gln Gly
115 120 125

Leu Lys Glu Tyr Ser Asn Trp Pro Thr Phe Pro Gln Leu Tyr Ile Gly
130 135 140

Gly Glu Phe Phe Gly Gly Cys Asp Ile Thr Leu Glu Ala Phe Lys Thr
145 150 155 160

Gly Glu Leu Gln Glu Glu Val Glu Lys Ala Met Cys Ser
165 170

<210> 39
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Met Ala Ala Ile Thr Ile Ser Ser Ser Leu His Ala Ser Ala Ser Pro	
1 5 10 15	
cg t gtt gtt cgt cca cat gtt tct cga aat acc cct gtg atc acc ctc	96
Arg Val Val Arg Pro His Val Ser Arg Asn Thr Pro Val Ile Thr Leu	
20 25 30	
tat tca cgc ttc aca cca tcc ttc tcc ttc cca tct ctc tcc ttc aca	144
Tyr Ser Arg Phe Thr Pro Ser Phe Ser Phe Pro Ser Leu Ser Phe Thr	
35 40 45	
ctc cgt gac aca gct ccg tct cgt cgt cgt tcc ttc ttt atc gcc tcc	192
Leu Arg Asp Thr Ala Pro Ser Arg Arg Arg Ser Phe Phe Ile Ala Ser	
50 55 60	
gcc gtc aaa tct cta acg gag acg gag ctg ctt cca atc aca gag gct	240
Ala Val Lys Ser Leu Thr Glu Thr Glu Leu Leu Pro Ile Thr Glu Ala	
65 70 75 80	
gat tca atc ccg tcc gct tcc ggt gta tac gct gta tac gat aag agc	288
Asp Ser Ile Pro Ser Ala Ser Gly Val Tyr Ala Val Tyr Asp Lys Ser	
85 90 95	

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gac gag ctt cag ttc gtc gga att tct cgg aac atc gct gcg agt gtc Asp Glu Leu Gln Phe Val Gly Ile Ser Arg Asn Ile Ala Ala Ser Val 100 105 110	336
tct gct cat ctc aaa tct gtg ccg gag ctt tgt ggc tcc gtt aag gtt Ser Ala His Leu Lys Ser Val Pro Glu Leu Cys Gly Ser Val Lys Val 115 120 125	384
gga ata gta gaa gaa cca gat aaa gca gtt tta aca caa gca tgg aaa Gly Ile Val Glu Glu Pro Asp Lys Ala Val Leu Thr Gln Ala Trp Lys 130 135 140	432
tta tgg ata gaa gaa cat ata aaa gta act gga aaa gtt ccg ccg ggg Leu Trp Ile Glu Glu His Ile Lys Val Thr Gly Lys Val Pro Pro Gly 145 150 155 160	480
aat aag tca ggg aac aac aca ttt gtc aaa caa act ccg agg aag aaa Asn Lys Ser Gly Asn Asn Thr Phe Val Lys Gln Thr Pro Arg Lys Lys 165 170 175	528
tcc gat atc cgt ctc act cca ggt cgc cat gtt gag ctc acg gtt cct Ser Asp Ile Arg Leu Thr Pro Gly Arg His Val Glu Leu Thr Val Pro 180 185 190	576
ttg gag gaa ctg att gac cgt tta gtg aaa gag agc aaa gtg gta gct Leu Glu Glu Leu Ile Asp Arg Leu Val Lys Glu Ser Lys Val Val Ala 195 200 205	624
ttc ata aaa gga tca agg agt gct cct caa tgt gga ttc tca cag aga Phe Ile Lys Gly Ser Arg Ser Ala Pro Gln Cys Gly Phe Ser Gln Arg 210 215 220	672
gtt gtt ggg att ctt gaa agc caa gga gtt gat tat gaa act gtt gat Val Val Gly Ile Leu Glu Ser Gln Gly Val Asp Tyr Glu Thr Val Asp 225 230 235 240	720
gtt ctt gac gat gag tat aat cat ggg cta agg gag acg ctt aag aac Val Leu Asp Asp Glu Tyr Asn His Gly Leu Arg Glu Thr Leu Lys Asn 245 250 255	768
tac agc aat tgg cca acg ttt cca cag ata ttt gtg aaa gga gaa ctt Tyr Ser Asn Trp Pro Thr Phe Pro Gln Ile Phe Val Lys Gly Glu Leu 260 265 270	816
gta gga gga tgt gat att ttg acc tca atg tat gaa aat ggt gaa ctt Val Gly Gly Cys Asp Ile Leu Thr Ser Met Tyr Glu Asn Gly Glu Leu 275 280 285	864
gcc aat atc ttg aac tag Ala Asn Ile Leu Asn 290	882

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 <211> 293
 <212> PRT
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Met Ala Ala Ile Thr Ile Ser Ser Ser Leu His Ala Ser Ala Ser Pro
1 5 10 15

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Arg Val Val Arg Pro His Val Ser Arg Asn Thr Pro Val Ile Thr Leu
20 25 30

Tyr Ser Arg Phe Thr Pro Ser Phe Ser Phe Pro Ser Leu Ser Phe Thr
35 40 45

Leu Arg Asp Thr Ala Pro Ser Arg Arg Arg Ser Phe Phe Ile Ala Ser
50 55 60

Ala Val Lys Ser Leu Thr Glu Thr Glu Leu Leu Pro Ile Thr Glu Ala
65 70 75 80

Asp Ser Ile Pro Ser Ala Ser Gly Val Tyr Ala Val Tyr Asp Lys Ser
85 90 95

Asp Glu Leu Gln Phe Val Gly Ile Ser Arg Asn Ile Ala Ala Ser Val
100 105 110

Ser Ala His Leu Lys Ser Val Pro Glu Leu Cys Gly Ser Val Lys Val
115 120 125

Gly Ile Val Glu Glu Pro Asp Lys Ala Val Leu Thr Gln Ala Trp Lys
130 135 140

Leu Trp Ile Glu Glu His Ile Lys Val Thr Gly Lys Val Pro Pro Gly
145 150 155 160

Asn Lys Ser Gly Asn Asn Thr Phe Val Lys Gln Thr Pro Arg Lys Lys
165 170 175

Ser Asp Ile Arg Leu Thr Pro Gly Arg His Val Glu Leu Thr Val Pro
180 185 190

Leu Glu Glu Leu Ile Asp Arg Leu Val Lys Glu Ser Lys Val Val Ala
195 200 205

Phe Ile Lys Gly Ser Arg Ser Ala Pro Gln Cys Gly Phe Ser Gln Arg
210 215 220

Val Val Gly Ile Leu Glu Ser Gln Gly Val Asp Tyr Glu Thr Val Asp
225 230 235 240

Val Leu Asp Asp Glu Tyr Asn His Gly Leu Arg Glu Thr Leu Lys Asn
245 250 255

Tyr Ser Asn Trp Pro Thr Phe Pro Gln Ile Phe Val Lys Gly Glu Leu
260 265 270

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Val Gly Gly Cys Asp Ile Leu Thr Ser Met Tyr Glu Asn Gly Glu Leu
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 1 5 10 15

Leu Arg His Ser Gly Ala Pro Leu Val Leu His Phe Trp Ala Ser Trp
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Cys Asp Ala Ser Lys Gln Met Asp Gln Val Phe Ser His Leu Ala Thr
 35 40 45

Asp Phe Pro Arg Ala His Phe Phe Arg Val Glu Ala Glu Glu His Pro
 50 55 60

Glu Ile Ser Glu Ala Tyr Ser Val Ala Leu Val Pro Tyr Phe Val Phe
 65 70 75 80

Phe Lys Asp Gly Lys Thr Val Asp Thr Leu Glu Gly Ala Asp Pro Ser
 85 90 95

Ser Leu Ala Asn Lys Val Gly Lys Val Ala Gly Ser Ile Thr Pro Ala
 100 105 110

Ser Leu Gly Leu Ala Ala Gly Pro Thr Ile Leu Glu Thr Val Lys Lys
 115 120 125

Asn Ala Lys Ala Ser Gly Gln Asp Arg Ala Gln Pro Val Ser Thr Ala
 130 135 140

Asp Ala Leu Lys Asn Arg Leu Glu Lys Leu Thr Leu Leu Cys Tyr Ser
 145 150 155 160

<210> 43
 <211> 1467
 <212> DNA
 <213> Arabidopsis thaliana
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 <222> (1)..(1464)
 <223> AtQ9ZPH2

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 Met Ser Gly Thr Val Lys Asp Ile Val Ser Lys Ala Glu Leu Asp Asn
 1 5 10 15

ttg cgc cag agc ggc gca cca gtc gtg ctt cac ttc tgg gct tct tgg 96
 Leu Arg Gln Ser Gly Ala Pro Val Val Leu His Phe Trp Ala Ser Trp
 20 25 30

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tgt gat gct tcg aag cag atg gat caa gtt ttc tct cat ctc gct act	144
Cys Asp Ala Ser Lys Gln Met Asp Gln Val Phe Ser His Leu Ala Thr	
35 40 45	
gat ttc cct cgt gct cac ttc ttt agg gtt gaa gct gag gaa cat cct	192
Asp Phe Pro Arg Ala His Phe Phe Arg Val Glu Ala Glu Glu His Pro	
50 55 60	
gag ata tct gag gct tac tct gtt gct gct gtg cct tat ttc gtc ttc	240
Glu Ile Ser Glu Ala Tyr Ser Val Ala Ala Val Pro Tyr Phe Val Phe	
65 70 75 80	
ttc aag gat ggt aaa act gtg gat aca ctt gag ggt gca gat cca tca	288
Phe Lys Asp Gly Lys Thr Val Asp Thr Leu Glu Gly Ala Asp Pro Ser	
85 90 95	
agt tta gct aat aag gtt ggc aaa gtt gct ggt tct agt act tct gcg	336
Ser Leu Ala Asn Lys Val Gly Lys Val Ala Gly Ser Ser Thr Ser Ala	
100 105 110	
gag cct gct gct cct gca agc tta ggg ttg gct gct ggg cca acg att	384
Glu Pro Ala Ala Pro Ala Ser Leu Gly Leu Ala Ala Gly Pro Thr Ile	
115 120 125	
ctt gaa act gtg aag gag aat gcg aaa gct tct tta caa gac cga gct	432
Leu Glu Thr Val Lys Glu Asn Ala Lys Ala Ser Leu Gln Asp Arg Ala	
130 135 140	
cag cct gta tct acc gcc gat gct ctc aag agc cgt ttg gaa aag ctc	480
Gln Pro Val Ser Thr Ala Asp Ala Leu Lys Ser Arg Leu Glu Lys Leu	
145 150 155 160	
act aat tct cac cct gtc atg tta ttc atg aaa ggt att cct gaa gag	528
Thr Asn Ser His Pro Val Met Leu Phe Met Lys Gly Ile Pro Glu Glu	
165 170 175	
cct agg tgt ggg ttt agc agg aaa gta gtt gac att ttg aaa gag gtt	576
Pro Arg Cys Gly Phe Ser Arg Lys Val Val Asp Ile Leu Lys Glu Val	
180 185 190	
aac gtt gat ttt gga agt ttt gac ata cta tcg gat aac gaa gtg cga	624
Asn Val Asp Phe Gly Ser Phe Asp Ile Leu Ser Asp Asn Glu Val Arg	
195 200 205	
gag ggt ttg aag aaa ttc tct aac tgg cca acg ttt cct cag ctg tac	672
Glu Gly Leu Lys Lys Phe Ser Asn Trp Pro Thr Phe Pro Gln Leu Tyr	
210 215 220	
tgc aac gga gag ctt ctt ggt gga gct gat atc gca ata gcg atg cac	720
Cys Asn Gly Glu Leu Leu Gly Gly Ala Asp Ile Ala Ile Ala Met His	
225 230 235 240	
gag agc ggt gaa cta aaa gat gct ttc aaa gat ctt ggg atc acg aca	768
Glu Ser Gly Glu Leu Lys Asp Ala Phe Lys Asp Leu Gly Ile Thr Thr	
245 250 255	
gtt ggt tca aaa gaa agt cag gat gaa gct gga aaa gga gga ggg gtt	816
Val Gly Ser Lys Glu Ser Gln Asp Glu Ala Gly Lys Gly Gly Gly Val	
260 265 270	
agt tca gga aac aca ggc tta agt gag acc ctc cga gct cgg ctc gaa	864
Ser Ser Gly Asn Thr Gly Leu Ser Glu Thr Leu Arg Ala Arg Leu Glu	
275 280 285	

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ggt ctg gtc aat tcc aaa cca gtt atg ctg ttc atg aaa gga aga cca Gly Leu Val Asn Ser Lys Pro Val Met Leu Phe Met Lys Gly Arg Pro 290 295 300	912
gaa gaa cca aag tgt ggg ttc agt ggg aaa gtg gtt gaa atc ctc aac Glu Glu Pro Lys Cys Gly Phe Ser Gly Lys Val Val Glu Ile Leu Asn 305 310 315 320	960
caa gaa aaa atc gag ttt ggg agt ttc gat atc ctc tta gat gac gaa Gln Glu Lys Ile Glu Phe Gly Ser Phe Asp Ile Leu Leu Asp Asp Glu 325 330 335	1008
gtt cgc caa ggc ctt aaa gtg tat tca aac tgg tca agc tat cct cag Val Arg Gln Gly Leu Lys Val Tyr Ser Asn Trp Ser Tyr Pro Gln 340 345 350	1056
ctt tac gtg aaa ggc gag ctt atg ggt gga tca gac att gtc ttg gag Leu Tyr Val Lys Gly Glu Leu Met Gly Gly Ser Asp Ile Val Leu Glu 355 360 365	1104
atg caa aag agc ggt gag ctg aaa aag gtc ttg acc gag aaa ggg atc Met Gln Lys Ser Gly Glu Leu Lys Lys Val Leu Thr Glu Lys Gly Ile 370 375 380	1152
act gga gaa cag agt ctt gaa gat aga ttg aag gca ctg atc aat tcc Thr Gly Glu Gln Ser Leu Glu Asp Arg Leu Lys Ala Leu Ile Asn Ser 385 390 395 400	1200
tcg gaa gta atg cta ttc atg aaa ggt tca cca gat gaa ccg aaa tgc Ser Glu Val Met Leu Phe Met Lys Gly Ser Pro Asp Glu Pro Lys Cys 405 410 415	1248
gga ttt agc tcc aaa gtt gtg aaa gca ttg aga gga gaa aac gtg agt Gly Phe Ser Ser Lys Val Val Lys Ala Leu Arg Gly Glu Asn Val Ser 420 425 430	1296
ttc gga tcg ttt gat atc ttg act gat gaa gaa gta agg caa ggg att Phe Gly Ser Phe Asp Ile Leu Thr Asp Glu Glu Val Arg Gln Gly Ile 435 440 445	1344
aag aat ttc tca aac tgg cca act ttt cct cag cta tac tac aaa ggt Lys Asn Phe Ser Asn Trp Pro Thr Phe Pro Gln Leu Tyr Tyr Lys Gly 450 455 460	1392
gag tta att gga gga tgt gat atc att atg gag cta agt gag agt ggt Glu Leu Ile Gly Gly Cys Asp Ile Ile Met Glu Leu Ser Glu Ser Gly 465 470 475 480	1440
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 1 5 10 15

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20 25 30

Cys Asp Ala Ser Lys Gln Met Asp Gln Val Phe Ser His Leu Ala Thr
35 40 45

Asp Phe Pro Arg Ala His Phe Phe Arg Val Glu Ala Glu Glu His Pro
50 55 60

Glu Ile Ser Glu Ala Tyr Ser Val Ala Ala Val Pro Tyr Phe Val Phe
65 70 75 80

Phe Lys Asp Gly Lys Thr Val Asp Thr Leu Glu Gly Ala Asp Pro Ser
85 90 95

Ser Leu Ala Asn Lys Val Gly Lys Val Ala Gly Ser Ser Thr Ser Ala
100 105 110

Glu Pro Ala Ala Pro Ala Ser Leu Gly Leu Ala Ala Gly Pro Thr Ile
115 120 125

Leu Glu Thr Val Lys Glu Asn Ala Lys Ala Ser Leu Gln Asp Arg Ala
130 135 140

Gln Pro Val Ser Thr Ala Asp Ala Leu Lys Ser Arg Leu Glu Lys Leu
145 150 155 160

Thr Asn Ser His Pro Val Met Leu Phe Met Lys Gly Ile Pro Glu Glu
165 170 175

Pro Arg Cys Gly Phe Ser Arg Lys Val Val Asp Ile Leu Lys Glu Val
180 185 190

Asn Val Asp Phe Gly Ser Phe Asp Ile Leu Ser Asp Asn Glu Val Arg
195 200 205

Glu Gly Leu Lys Lys Phe Ser Asn Trp Pro Thr Phe Pro Gln Leu Tyr
210 215 220

Cys Asn Gly Glu Leu Leu Gly Gly Ala Asp Ile Ala Ile Ala Met His
225 230 235 240

Glu Ser Gly Glu Leu Lys Asp Ala Phe Lys Asp Leu Gly Ile Thr Thr
245 250 255

Val Gly Ser Lys Glu Ser Gln Asp Glu Ala Gly Lys Gly Gly Gly Val
260 265 270

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Ser Ser Gly Asn Thr Gly Leu Ser Glu Thr Leu Arg Ala Arg Leu Glu
275 280 285

Gly Leu Val Asn Ser Lys Pro Val Met Leu Phe Met Lys Gly Arg Pro
290 295 300

Glu Glu Pro Lys Cys Gly Phe Ser Gly Lys Val Val Glu Ile Leu Asn
305 310 315 320

Gln Glu Lys Ile Glu Phe Gly Ser Phe Asp Ile Leu Leu Asp Asp Glu
325 330 335

Val Arg Gln Gly Leu Lys Val Tyr Ser Asn Trp Ser Ser Tyr Pro Gln
340 345 350

Leu Tyr Val Lys Gly Glu Leu Met Gly Gly Ser Asp Ile Val Leu Glu
355 360 365

Met Gln Lys Ser Gly Glu Leu Lys Lys Val Leu Thr Glu Lys Gly Ile
370 375 380

Thr Gly Glu Gln Ser Leu Glu Asp Arg Leu Lys Ala Leu Ile Asn Ser
385 390 395 400

Ser Glu Val Met Leu Phe Met Lys Gly Ser Pro Asp Glu Pro Lys Cys
405 410 415

Gly Phe Ser Ser Lys Val Val Lys Ala Leu Arg Gly Glu Asn Val Ser
420 425 430

Phe Gly Ser Phe Asp Ile Leu Thr Asp Glu Glu Val Arg Gln Gly Ile
435 440 445

Lys Asn Phe Ser Asn Trp Pro Thr Phe Pro Gln Leu Tyr Tyr Lys Gly
450 455 460

Glu Leu Ile Gly Gly Cys Asp Ile Ile Met Glu Leu Ser Glu Ser Gly
465 470 475 480

Asp Leu Lys Ala Thr Leu Ser Glu
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atccggtctc gctatctctc ttccgcatct cgggacgcg atg gcg gcg ctg ctg 114
Met Ala Ala Leu Leu
1 5
ggc cgg agg ttc ggg atg gcg gcg gcg gcg ctc atc gcc ctc gcg gcg 162
Gly Arg Arg Phe Gly Met Ala Ala Ala Ala Leu Ile Ala Leu Ala Ala
10 15 20
ctc gga tcc gcc gcc tcg ggg acg gcg tcc aag tcg tcc ttc gtg aaa 210
Leu Gly Ser Ala Ala Ser Gly Thr Ala Ser Lys Ser Ser Phe Val Lys
25 30 35
tcc acc gtc aaa gcc cac gac gtc gtc ata ttc tcc aag tca tac tgc 258
Ser Thr Val Lys Ala His Asp Val Val Ile Phe Ser Lys Ser Tyr Cys
40 45 50
ccg tac tgt aga aga gcc aaa gct gtg ttc aag gaa ctt gaa ctg aag 306
Pro Tyr Cys Arg Arg Ala Lys Ala Val Phe Lys Glu Leu Glu Leu Lys
55 60 65
aag gag ccg tat gtt gtg gag ctt gat caa cga gag gat ggt tgg gag 354
Lys Glu Pro Tyr Val Val Glu Leu Asp Gln Arg Glu Asp Gly Trp Glu
70 75 80 85
att cag gat gcc tta tct gac atg gtt ggc agg cga act gtt cct caa 402
Ile Gln Asp Ala Leu Ser Asp Met Val Gly Arg Arg Thr Val Pro Gln
90 95 100
gtt ttt gtc cat ggg aag cac ctg ggt ggc tct gat gat act gtt gaa 450
Val Phe Val His Gly Lys His Leu Gly Gly Ser Asp Asp Thr Val Glu
105 110 115
gca tat gag agt ggc aag cta gcc aaa ctt ttg aac att gat gtc aaa 498
Ala Tyr Glu Ser Gly Lys Leu Ala Lys Leu Leu Asn Ile Asp Val Lys
120 125 130
gaa gat ctt tgagtagtaa tagtttagca tcaatggcag gcctctttca 547
Glu Asp Leu
135
tttccataga acatacccaa atactatgca actatgaatt cttcatagaa tttggctgtg 607
aatgtcctct ttagcccctt t 628

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Ile Ala Leu Ala Ala Leu Gly Ser Ala Ala Ser Gly Thr Ala Ser Lys
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20

25

30

Ser Ser Phe Val Lys Ser Thr Val Lys Ala His Asp Val Val Ile Phe
35 40 45

Ser Lys Ser Tyr Cys Pro Tyr Cys Arg Arg Ala Lys Ala Val Phe Lys
50 55 60

Glu Leu Glu Leu Lys Lys Glu Pro Tyr Val Val Glu Leu Asp Gln Arg
65 70 75 80

Glu Asp Gly Trp Glu Ile Gln Asp Ala Leu Ser Asp Met Val Gly Arg
85 90 95

Arg Thr Val Pro Gln Val Phe Val His Gly Lys His Leu Gly Gly Ser
100 105 110

Asp Asp Thr Val Glu Ala Tyr Glu Ser Gly Lys Leu Ala Lys Leu Leu
115 120 125

Asn Ile Asp Val Lys Glu Asp Leu
130 135

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Met Gly Ile Ala Ser Ser Ser Ser Ser
1 5

acc ccg gaa tcc agg aag atg gcg ctc gcc aag gcc aag gag acc gtc 160
Thr Pro Glu Ser Arg Lys Met Ala Leu Ala Lys Ala Lys Glu Thr Val
10 15 20 25

gcc tcc gct ccc gtc gtc gtc tac agc aag tct tac tgt cct ttt tgc 208
Ala Ser Ala Pro Val Val Val Tyr Ser Lys Ser Tyr Cys Pro Phe Cys
30 35 40

gtc cgt gtg aag aag ttg ttc gag cag ctt gga gca act ttc aag gcc 256
Val Arg Val Lys Lys Leu Phe Glu Gln Leu Gly Ala Thr Phe Lys Ala
45 50 55

att gag ttg gat ggg gag agt gat gga tct gag ctg cag tcg gca ctt 304
Ile Glu Leu Asp Gly Glu Ser Asp Gly Ser Glu Leu Gln Ser Ala Leu
60 65 70

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gct gaa tgg act gga caa agg act gtt cca aat gtc ttc atc aat ggg 352
Ala Glu Trp Thr Gly Gln Arg Thr Val Pro Asn Val Phe Ile Asn Gly
75 80 85

aag cat att ggt ggc tgt gat gat act ttg gca ttg aac aat gaa ggg 400
Lys His Ile Gly Gly Cys Asp Asp Thr Leu Ala Leu Asn Asn Glu Gly
90 95 100 105

aag ctg gtg cct ctg ctg acc gag gct gga gca att gcc agt tct gca 448
Lys Leu Val Pro Leu Leu Thr Glu Ala Gly Ala Ile Ala Ser Ser Ala
110 115 120

aag acg aca atc acc gca tagttcttcg tgggacactg ggactagcct 496
Lys Thr Thr Ile Thr Ala
125

tcgttgacct ctttatactg catccattct attagataat aaagggtggat gtttgtttg 556

caagaccatt acttgttgcc gtctagtatc gtgtgatagc tatcctgtgc ccgtgtgaaa 616

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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaa 733

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Tyr Ser Lys Ser Tyr Cys Pro Phe Cys Val Arg Val Lys Lys Leu Phe
35 40 45

Glu Gln Leu Gly Ala Thr Phe Lys Ala Ile Glu Leu Asp Gly Glu Ser
50 55 60

Asp Gly Ser Glu Leu Gln Ser Ala Leu Ala Glu Trp Thr Gly Gln Arg
65 70 75 80

Thr Val Pro Asn Val Phe Ile Asn Gly Lys His Ile Gly Gly Cys Asp
85 90 95

Asp Thr Leu Ala Leu Asn Asn Glu Gly Lys Leu Val Pro Leu Leu Thr
100 105 110

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 Met Pro Pro Arg Ser Leu Thr
 1 5
 ctc tcc cgc ctt ccc gtg gcc gcc ctt ggc ctc ccc ttc tct tct tgc 160
 Leu Ser Arg Leu Pro Val Ala Ala Leu Gly Leu Pro Phe Ser Ser Cys
 10 15 20
 tcc ccg cct cct cct cgc ctt cgc ttc ccc ttc gcc gca cgc cgc gcc 208
 Ser Pro Pro Pro Pro Arg Leu Arg Phe Pro Phe Ala Ala Arg Arg Ala
 25 30 35
 agg tcc ctc gcc acc agg gcc tcc tcc tcc tct ccg gat tcc tcc ttc 256
 Arg Ser Leu Ala Thr Arg Ala Ser Ser Ser Ser Pro Asp Ser Ser Phe
 40 45 50 55
 ggc tcg cgg atg gag gac tct gtc aag agg acg ctc gcc gac aac ccc 304
 Gly Ser Arg Met Glu Asp Ser Val Lys Arg Thr Leu Ala Asp Asn Pro
 60 65 70
 gtc gtc atc tac tcc aag tcc tgg tgc tcc tac tcc atg gag gtc aag 352
 Val Val Ile Tyr Ser Lys Ser Trp Cys Ser Tyr Ser Met Glu Val Lys
 75 80 85
 gcg ctc ttc aag cgg atc gcc gtc cag ccg cac gtc atc gag ctc gac 400
 Ala Leu Phe Lys Arg Ile Gly Val Gln Pro His Val Ile Glu Leu Asp
 90 95 100
 caa ctc gcc gca cag gga cct cag ttg caa aag gtg tta gag cgg ctg 448
 Gln Leu Gly Ala Gln Gly Pro Gln Leu Gln Lys Val Leu Glu Arg Leu
 105 110 115
 act gga cag tcc act gtt cct aat gtt ttc att ggt gga aag cac att 496
 Thr Gly Gln Ser Thr Val Pro Asn Val Phe Ile Gly Gly Lys His Ile
 120 125 130 135
 ggt ggc tgt aca gat act gtg aag ctt cat cgc aaa ggg gag cta gct 544
 Gly Gly Cys Thr Asp Thr Val Lys Leu His Arg Lys Gly Glu Leu Ala
 140 145 150
 acc atg ctg tca gag ctg gat atc gac gtc aac aac tca tga 586
 Thr Met Leu Ser Glu Leu Asp Ile Asp Val Asn Asn Ser
 155 160
 caacattgaa catggtttgc tatactggat atctgaggtt tcaatgactt gagcagtcgt 646
 gtaatgagat ttgttagcca tgtttactaa ttcaatgcac attttatgta accgcttccc 706
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Pro Phe Ala Ala Arg Arg Ala Arg Ser Leu Ala Thr Arg Ala Ser Ser
35 40 45

Ser Ser Pro Asp Ser Ser Phe Gly Ser Arg Met Glu Asp Ser Val Lys
50 55 60

Arg Thr Leu Ala Asp Asn Pro Val Val Ile Tyr Ser Lys Ser Trp Cys
65 70 75 80

Ser Tyr Ser Met Glu Val Lys Ala Leu Phe Lys Arg Ile Gly Val Gln
85 90 95

Pro His Val Ile Glu Leu Asp Gln Leu Gly Ala Gln Gly Pro Gln Leu
100 105 110

Gln Lys Val Leu Glu Arg Leu Thr Gly Gln Ser Thr Val Pro Asn Val
115 120 125

Phe Ile Gly Gly Lys His Ile Gly Gly Cys Thr Asp Thr Val Lys Leu
130 135 140

His Arg Lys Gly Glu Leu Ala Thr Met Leu Ser Glu Leu Asp Ile Asp
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Val Asn Asn Ser

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44

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46

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38